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Direct and Safe Approach in the Treatment of Subcondylar Fractures

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ABSTRACT

Jaw fractures are a major cause of functional disability and social and cosmetic morbidity. Despite the high incidence of subcondylar fractures, their treatment remains controversial. In recent years and hand in hand with a refinement of surgical techniques and osteosynthesis, the focus has shifted to surgery. An optimal approach is one that allows the surgeon to perform an anatomical reduction under direct vision to avoid damage to facial nerve branches due to manipulation of the fragments or the approach per se and ultimately, that the scar is aesthetically acceptable. The aim of this paper is to offer a direct and safe approach, through the study of the technique in cadavers. A safe approach was found in most cases through incisions 13 mm from the preauricular line, as well as incisions with a length of 20 mm.

KEYWORDS: Jaw fractures, Surgical Procedures, Operative, Plastic Surgery Procedures.

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INTRODUCTION

The mandible is the only movable bone in the facial skeleton, constituting the lower third of the total facial height, and is especially important in functions such as speech, swallowing, and breathing. It also forms an aesthetically prominent area, giving people their unique facial features. Due to the reasons previously stated and its prominent anatomical position, the mandible is especially vulnerable to injury; Jaw fractures are a major cause of functional disability and social and cosmetic morbidity (1). Despite the high incidence of subcondylar fractures, their treatment remains controversial (2,3). For decades, closed reduction has been preferred, however, this requires variable periods of maxillomandibular fixation ranging from 0 to 4 weeks (4) and is not exempt from complications such as pain, ankylosis and intrinsic alteration of the temporomandibular joint (3,4). In recent years and hand in hand with a refinement of surgical techniques and osteosynthesis, the focus has shifted to surgery, whose success is based on 3 principles: 1) whether open or closed reduction should be performed, 2) the optimal approach and 3) what type of osteosynthesis is required (3). An optimal approach is one that allows the surgeon to perform an anatomical reduction under direct vision to avoid damage to facial nerve branches due to manipulation of the fragments or the approach per se (5) and ultimately, that the scar is aesthetically acceptable. The aim of this paper focuses on the second principle, offering a direct and safe approach, through the study of the technique in cadavers.

MATERIAL AND METHODS

The present study was conducted in the facilities of the amphitheater of the School of Medicine, in Mexico City, Mexico. During the period from December 15, 2021, to February 11, 2021, by dissecting 18 mandibles from previously formalized adult cadavers. The approach was performed by tracing a Frankfurt line, corresponding to the

upper limit of the incision, and a parallel line located at 10, 15, or 20 cm corresponding to the lower limit. Incisions were made at 7 distinct levels: at the level of the preauricular line, at 5 mm, 10 mm, 13 mm, 14 mm, 15 mm and 20 mm. A meticulous dissection was conducted, arriving at a direct subcondylar approach. The data from the dissections were entered into an Excel-like spreadsheet. The STATA program was used for statistical analysis.

RESULTS

A total of 11 cadavers were dissected, 10 of which were male and only one of which was female. Their ages ranged from 26 to 62 years (mean 41 years). A bilateral dissection could be performed in 7 cadavers and only a unilateral dissection was performed in 4 of them. Most of the dissections were performed on the right side (55%), compared to 45% (8) on the left side. A direct approach was achieved in 55% (10). Most of the direct approaches were achieved from the right side (60%) versus the left side (40%). In most cases, incisions of 20 mm (66%) were made, followed by 15 mm (22%) and 10 mm (11%). In most cases, a direct approach was achieved through 20 mm incisions (60%). Approaches were made through 7 types of incisions: at the level of the preauricular line (11%), at 5 mm (5%), at 10 mm (22%), at 13 mm (27%), at 14 mm (5), at 15 mm (11%) and at 20 mm (16%). Most direct approaches were achieved by incisions at 13 mm from the preauricular line (40%), followed by incisions at 20 mm from the preauricular line (30%).

DISCUSSION

Condyle fractures treated by surgical approach represent an effective and long-lasting treatment method. It is now accepted that the clinical results obtained by open treatment with rigid fixation are superior to those obtained by conservative treatment (6). A preauricular approach may be considered in the case of condylar neck fractures, considering the high incidence of facial nerve injury with the retromandibular approach, because it offers an access route that is not in the vicinity of the facial nerve branches (6). Intraoral approaches avoid visible scars, however, surgical procedures in these cases are more arduous due to access and limited visibility; In addition, endoscopic assistance and angled or transoral instruments are constantly required, which lengthens surgical times and the doctor's learning curve (4). That is why the preauricular approach seems proper in well-selected cases.

CONCLUSION

A safe approach was found in most cases through incisions 13 mm from the preauricular line, as well as incisions with a length of 20 mm. There is still no clinical trial in living patients, however, the results of the cadaver approach show encouraging and innovative results.

CONFLICTS OF INTEREST

None.

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FIGURES AND TABLES

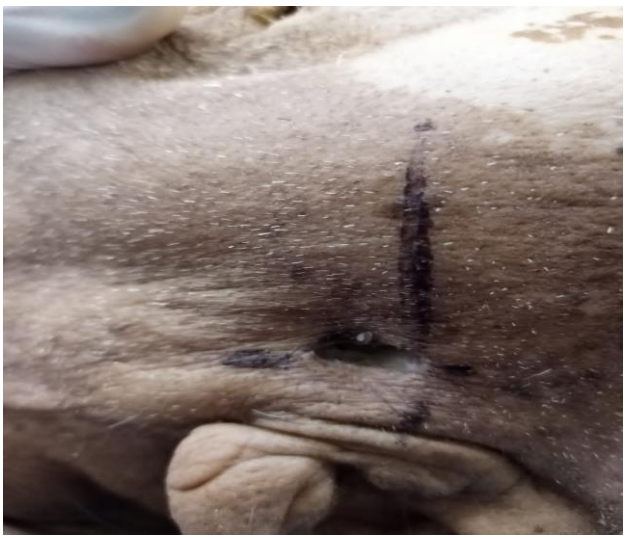

Figure 1. Frankfurt line

Figure 2. Direct subcondylar approach

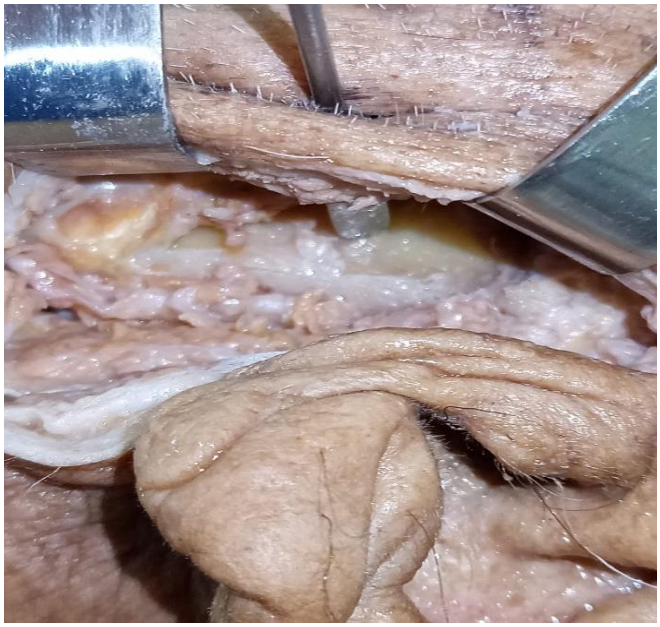

Figure 3. Meticulous dissection

Table 1. Characteristics of dissection

Dissection	TYPE OF APPROACH	INCISION MEASUREMENT	SIDE	DIRECT APPROACH
Dissection 1	PRE-ATRIAL LINE	15 MM	LEFT	NO
Dissection 2	20 MM	20 MM	RIGHT	YES
Dissection 3	10 MM	20 MM	LEFT	YES
Dissection 4	PRE-ATRIAL LINE	20 MM	RIGHT	NO
Dissection 5	5 MM	20 MM	LEFT	NO
Dissection 6	10 MM	20 MM	LEFT	NO
Dissection 7	10 MM	20 MM	RIGHT	NO
Dissection 8	15 MM	20 MM	RIGHT	NO
Dissection 9	14 MM	10 MM	LEFT	YES
Dissection 10	10 MM	15 MM	RIGHT	YES
Dissection 11	13 MM	10 MM	LEFT	NO
Dissection 12	13 MM	15 MM	RIGHT	YES
Dissection 13	13 MM	15 MM	LEFT	YES
Dissection 14	13 MM	20 MM	RIGHT	YES
Dissection 15	13 MM	20 MM	LEFT	YES
Dissection 16	15 MM	20 MM	RIGHT	NO
Dissection 17	20 MM	20 MM	RIGHT	YES
Dissection 18	20 MM	20 MM	RIGHT	YES